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<120> VACCINE AGAINST SARS

<130> 19450

<140> CN03142873.8

<141> 2003-06-17

<160> 37

<170> PatentIn version 3.2

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aatggatcca atttatgatg agccgacgac gactactagc gtgcctttgt aagcacaaga 240
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Asp Ser Val Glu Glu Ala Leu Ser Glu Ala Arg Glu His Leu Lys Asn
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Gly Thr Cys Gly Leu Val Glu Leu Glu Lys Gly Val Leu Pro Gln Leu
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Glu Gln Pro Tyr Val Phe Ile Lys Arg Ser Asp Ala Leu Ser Thr Asn
65 70 75 80

His Cys His Lys Val Val Glu Leu Val Ala Glu Met Asp Gly Ile Gln
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Tyr Gly Arg Ser Gly Ile Thr Leu Gly Val Leu Val Pro His Val Gly
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Glu Thr Pro Ile Ala Tyr Arg Asn Val Leu Leu Arg Lys Asn Gly Asn
115 120 125

Lys Gly Ala Gly Gly His Ser Tyr Gly Ile Asp Leu Lys Ser Tyr Asp
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Leu Gly Asp Glu Leu Gly Thr Asp Pro Ile Glu Asp Tyr Glu Gln Asn
145 150 155 160

Trp Asn Thr Lys His Gly Ser Gly Ala Leu Arg Glu Leu Thr Arg Glu
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Leu Asn Gly Gly Ala Val Thr Arg Tyr Val Asp Asn Asn Phe Cys Gly
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Phe Thr Glu Arg Ser Asp Lys Ser Tyr Glu His Gln Thr Pro Phe Glu
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Phe Val Phe Pro Leu Asn Ser Lys Val Lys Val Ile Gln Pro Arg Val
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Glu Lys Lys Lys Thr Glu Gly Phe Met Gly Arg Ile Arg Ser Val Tyr
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Pro Val Ala Ser Pro Gln Glu Cys Asn Asn Met His Leu Ser Thr Leu
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Met Lys Cys Asn His Cys Asp Glu Val Ser Trp Gln Thr Cys Asp Phe
325 330 335

Leu Lys Ala Thr Cys Glu His Cys Gly Thr Glu Asn Leu Val Ile Glu
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Gly Pro Thr Thr Cys Gly Tyr Leu Pro Thr Asn Ala Val Val Lys Met
355 360 365

Pro Cys Pro Ala Cys Gln Asp Pro Glu Ile Gly Pro Glu His Ser Val
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Ala Asp Tyr His Asn His Ser Asn Ile Glu Thr Arg Leu Arg Lys Gly
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Tyr Asn Lys Arg Ala Tyr Trp Val Pro Arg Ala Ser Ala Asp Ile Gly
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Ser Gly His Thr Gly Ile Thr Gly Asp Asn Val Glu Thr Leu Asn Glu
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Ser Ala Ser Thr Ser Ala Phe Ile Asp Thr Ile Lys Ser Leu Asp Tyr

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Asp	Cys	Val	Lys	Cys	Phe	Ile	Asp	Val	Val	Asn	Lys	Ala	Leu	Glu	Met				
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Cys	Ile	Asp	Gln	Val	Thr	Ile	Ala	Gly	Ala	Lys	Leu	Arg	Ser	Leu	Asn				
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Leu	Gly	Glu	Val	Phe	Ile	Ala	Gln	Ser	Lys	Gly	Leu	Tyr	Arg	Gln	Cys				
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Ser	Glu	Glu	Val	Val	Leu	Lys	Asn	Gly	Glu	Leu	Glu	Ala	Leu	Glu	Thr	
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Tyr Leu Lys Leu Thr Asp Asn Val Ala Ile Lys Cys Ala Asp Ile
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Val Lys Glu Ala Gln Ser Ala Asn Pro Met Val Ile Val Asn Ala
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Pro Arg Val Glu Ala Pro Lys Gln Glu Glu Pro Pro Asn Thr Glu
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1220						1225					1230			
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1235						1240					1245			
Gly	Glu	Asp	Met	Ser	Phe	Leu	Glu	Lys	Asp	Ala	Pro	Tyr	Met	Val
1250						1255					1260			
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1265						1270					1275			
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1280						1285					1290			
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1295						1300					1305			
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1310						1315					1320			
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Glu Glu His Phe Val Glu Thr	Val Ser Leu Ala Gly	Ser Tyr Arg		
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Leu Lys Arg Gly Asp Lys Ile	Val Tyr His Thr Leu	Glu Ser Pro		
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Val Glu Phe His Leu Asp Gly	Glu Val Leu Ser Leu	Asp Lys Leu		
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Lys Ser Leu Leu Ser Leu Arg	Glu Val Lys Thr Ile	Lys Val Phe		
1535	1540	1545		
Thr Thr Val Asp Asn Thr Asn	Leu His Thr Gln Leu	Val Asp Met		
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Ser Met Thr Tyr Gly Gln Gln	Phe Gly Pro Thr Tyr	Leu Asp Gly		
1565	1570	1575		
Ala Asp Val Thr Lys Ile Lys	Pro His Val Asn His	Glu Gly Lys		
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Thr Phe Phe Val Leu Pro Ser	Asp Asp Thr Leu Arg	Ser Glu Ala		
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Phe Glu Tyr Tyr His Thr Leu	Asp Glu Ser Phe Leu	Gly Arg Tyr		
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Val	Thr	Tyr	Thr	Glu	Ile	Glu	Pro	Lys	Leu	Asp	Gly	Tyr	Tyr	Lys
1865						1870					1875			
Lys	Asp	Asn	Ala	Tyr	Tyr	Thr	Glu	Gln	Pro	Ile	Asp	Leu	Val	Pro
1880						1885					1890			
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Cys	Ser	Asn	Thr	Lys	Phe	Ala	Asp	Asp	Leu	Asn	Gln	Met	Thr	Gly
1910						1915					1920			
Phe	Thr	Lys	Pro	Ala	Ser	Arg	Glu	Leu	Ser	Val	Thr	Phe	Phe	Pro
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Ala	Ser	Phe	Lys	Lys	Gly	Ala	Lys	Leu	Leu	His	Lys	Pro	Ile	Val
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2015						2020					2025			
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Ala	Ala	Tyr	Val	Glu	Asn	Thr	Ser	Ile	Thr	Ile	Lys	Lys	Pro	Asn
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Val	Phe	Thr	Leu	Leu	Phe	Gln	Leu	Cys	Thr	Phe	Thr	Lys	Ser	Thr
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Gly Tyr Phe Ala Ser His Phe Ile Ser Asn Ser Trp Leu Met Trp				
2330		2335		2340
Phe Ile Ile Ser Ile Val Gln Met Ala Pro Val Ser Ala Met Val				
2345		2350		2355
Arg Met Tyr Ile Phe Phe Ala Ser Phe Tyr Tyr Ile Trp Lys Ser				
2360		2365		2370
Tyr Val His Ile Met Asp Gly Cys Thr Ser Ser Thr Cys Met Met				
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Cys Tyr Lys Arg Asn Arg Ala Thr Arg Val Glu Cys Thr Thr Ile				
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Arg Gly Phe Cys Lys Thr His Asn Trp Asn Cys Leu Asn Cys Asp				
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Thr Phe Cys Thr Gly Ser Thr Phe Ile Ser Asp Glu Val Ala Arg				
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Asp Leu Ser Leu Gln Phe Lys Arg Pro Ile Asn Pro Thr Asp Gln				
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Ser Ser Tyr Ile Val Asp Ser Val Ala Val Lys Asn Gly Ala Leu				
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His Leu Tyr Phe Asp Lys Ala Gly Gln Lys Thr Tyr Glu Arg His				
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Ser	Lys	Cys	Asp	Glu	Ser	Ala	Ser	Lys	Ser	Ala	Ser	Val	Tyr	Tyr
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Gly	Asp	Ser	Cys	Asn	Asn	Phe	Met	Leu	Thr	Tyr	Asn	Lys	Val	Glu
2645						2650					2655			
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2690						2695					2700			
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2705						2710					2715			
Leu	Thr	Cys	Ala	Thr	Thr	Arg	Gln	Val	Val	Asn	Val	Ile	Thr	Thr
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Lys Ile Ser Leu Lys Gly Gly Lys Ile Val Ser Thr Trp Phe Lys
 2735 2740 2745

Leu Met Leu Lys Ala Thr Leu Leu Cys Val Leu Ala Ala Leu Val
 2750 2755 2760

Cys Tyr Ile Val Met Pro Val His Thr Leu Ser Ile His Asp Gly
 2765 2770 2775

Tyr Thr Asn Glu Ile Ile Gly Tyr Lys Ala Ile Gln Asp Gly Val
 2780 2785 2790

Thr Arg Asp Ile Ile Ser Thr Asp Asp Cys Phe Ala Asn Lys His
 2795 2800 2805

Ala Gly Phe Asp Ala Trp Phe Ser Gln Arg Gly Gly Ser Tyr Lys
 2810 2815 2820

Asn Asp Lys Ser Cys Pro Val Val Ala Ala Ile Ile Thr Arg Glu
 2825 2830 2835

Ile Gly Phe Ile Val Pro Gly Leu Pro Gly Thr Val Leu Arg Ala
 2840 2845 2850

Ile Asn Gly Asp Phe Leu His Phe Leu Pro Arg Val Phe Ser Ala
 2855 2860 2865

Val Gly Asn Ile Cys Tyr Thr Pro Ser Lys Leu Ile Glu Tyr Ser
 2870 2875 2880

Asp Phe Ala Thr Ser Ala Cys Val Leu Ala Ala Glu Cys Thr Ile
 2885 2890 2895

Phe Lys Asp Ala Met Gly Lys Pro Val Pro Tyr Cys Tyr Asp Thr
 2900 2905 2910

Asn Leu Leu Glu Gly Ser Ile Ser Tyr Ser Glu Leu Arg Pro Asp
 2915 2920 2925

Thr Arg Tyr Val Leu Met Asp Gly Ser Ile Ile Gln Phe Pro Asn
 2930 2935 2940

Ile Tyr Leu Glu Gly Ser Val Arg Val Val Thr Thr Phe Asp Ala
 2945 2950 2955

Glu	Tyr	Cys	Arg	His	Gly	Thr	Cys	Glu	Arg	Ser	Glu	Ala	Gly	Ile
2960						2965					2970			
Cys	Leu	Ser	Thr	Ser	Gly	Arg	Trp	Val	Leu	Asn	Asn	Glu	His	Tyr
2975						2980					2985			
Arg	Ala	Leu	Ser	Gly	Val	Phe	Cys	Gly	Val	Asp	Ala	Met	Asn	Leu
2990						2995					3000			
Ile	Ala	Asn	Ile	Phe	Thr	Pro	Leu	Val	Gln	Pro	Val	Gly	Ala	Leu
3005						3010					3015			
Asp	Val	Ser	Ala	Ser	Val	Val	Ala	Gly	Gly	Ile	Ile	Ala	Ile	Leu
3020						3025					3030			
Val	Thr	Cys	Ala	Ala	Tyr	Tyr	Phe	Met	Lys	Phe	Arg	Arg	Ala	Phe
3035						3040					3045			
Gly	Glu	Tyr	Asn	His	Val	Val	Ala	Ala	Asn	Ala	Leu	Leu	Phe	Leu
3050						3055					3060			
Met	Ser	Phe	Thr	Ile	Leu	Cys	Leu	Ala	Pro	Ala	Tyr	Ser	Phe	Leu
3065						3070					3075			
Pro	Gly	Val	Tyr	Ser	Val	Phe	Tyr	Leu	Tyr	Leu	Thr	Phe	Tyr	Phe
3080						3085					3090			
Thr	Asn	Asp	Val	Ser	Phe	Leu	Ala	His	Leu	Gln	Trp	Phe	Ala	Met
3095						3100					3105			
Phe	Ser	Pro	Ile	Val	Pro	Phe	Trp	Ile	Thr	Ala	Ile	Tyr	Val	Phe
3110						3115					3120			
Cys	Ile	Ser	Leu	Lys	His	Cys	His	Trp	Phe	Phe	Asn	Asn	Tyr	Leu
3125						3130					3135			
Arg	Lys	Arg	Val	Met	Phe	Asn	Gly	Val	Thr	Phe	Ser	Thr	Phe	Glu
3140						3145					3150			
Glu	Ala	Ala	Leu	Cys	Thr	Phe	Leu	Leu	Asn	Lys	Glu	Met	Tyr	Leu
3155						3160					3165			
Lys	Leu	Arg	Ser	Glu	Thr	Leu	Leu	Pro	Leu	Thr	Gln	Tyr	Asn	Arg

3170		3175		3180
Tyr Leu Ala Leu Tyr Asn Lys	Tyr Lys Tyr Phe Ser	Gly Ala Leu		
3185	3190	3195		
Asp Thr Thr Ser Tyr Arg Glu	Ala Ala Cys Cys His	Leu Ala Lys		
3200	3205	3210		
Ala Leu Asn Asp Phe Ser Asn	Ser Gly Ala Asp Val	Leu Tyr Gln		
3215	3220	3225		
Pro Pro Gln Thr Ser Ile Thr	Ser Ala Val Leu Gln	Ser Gly Phe		
3230	3235	3240		
Arg Lys Met Ala Phe Pro Ser	Gly Lys Val Glu Gly	Cys Met Val		
3245	3250	3255		
Gln Val Thr Cys Gly Thr Thr	Thr Leu Asn Gly Leu	Trp Leu Asp		
3260	3265	3270		
Asp Thr Val Tyr Cys Pro Arg	His Val Ile Cys Thr	Ala Glu Asp		
3275	3280	3285		
Met Leu Asn Pro Asn Tyr Glu	Asp Leu Leu Ile Arg	Lys Ser Asn		
3290	3295	3300		
His Ser Phe Leu Val Gln Ala	Gly Asn Val Gln Leu	Arg Val Ile		
3305	3310	3315		
Gly His Ser Met Gln Asn Cys	Leu Leu Arg Leu Lys	Val Asp Thr		
3320	3325	3330		
Ser Asn Pro Lys Thr Pro Lys	Tyr Lys Phe Val Arg	Ile Gln Pro		
3335	3340	3345		
Gly Gln Thr Phe Ser Val Leu	Ala Cys Tyr Asn Gly	Ser Pro Ser		
3350	3355	3360		
Gly Val Tyr Gln Cys Ala Met	Arg Pro Asn His Thr	Ile Lys Gly		
3365	3370	3375		
Ser Phe Leu Asn Gly Ser Cys	Gly Ser Val Gly Phe	Asn Ile Asp		
3380	3385	3390		

Tyr Asp Cys Val Ser Phe Cys Tyr Met His His Met Glu Leu Pro
 3395 3400 3405

Thr Gly Val His Ala Gly Thr Asp Leu Glu Gly Lys Phe Tyr Gly
 3410 3415 3420

Pro Phe Val Asp Arg Gln Thr Ala Gln Ala Ala Gly Thr Asp Thr
 3425 3430 3435

Thr Ile Thr Leu Asn Val Leu Ala Trp Leu Tyr Ala Ala Val Ile
 3440 3445 3450

Asn Gly Asp Arg Trp Phe Leu Asn Arg Phe Thr Thr Thr Leu Asn
 3455 3460 3465

Asp Phe Asn Leu Val Ala Met Lys Tyr Asn Tyr Glu Pro Leu Thr
 3470 3475 3480

Gln Asp His Val Asp Ile Leu Gly Pro Leu Ser Ala Gln Thr Gly
 3485 3490 3495

Ile Ala Val Leu Asp Met Cys Ala Ala Leu Lys Glu Leu Leu Gln
 3500 3505 3510

Asn Gly Met Asn Gly Arg Thr Ile Leu Gly Ser Thr Ile Leu Glu
 3515 3520 3525

Asp Glu Phe Thr Pro Phe Asp Val Val Arg Gln Cys Ser Gly Val
 3530 3535 3540

Thr Phe Gln Gly Lys Phe Lys Lys Ile Val Lys Gly Thr His His
 3545 3550 3555

Trp Met Leu Leu Thr Phe Leu Thr Ser Leu Leu Ile Leu Val Gln
 3560 3565 3570

Ser Thr Gln Trp Ser Leu Phe Phe Phe Val Tyr Glu Asn Ala Phe
 3575 3580 3585

Leu Pro Phe Thr Leu Gly Ile Met Ala Ile Ala Ala Cys Ala Met
 3590 3595 3600

Leu Leu Val Lys His Lys His Ala Phe Leu Cys Leu Phe Leu Leu
 3605 3610 3615

Pro Ser Leu Ala Thr Val Ala Tyr Phe Asn Met Val Tyr Met Pro
 3620 3625 3630

Ala Ser Trp Val Met Arg Ile Met Thr Trp Leu Glu Leu Ala Asp
 3635 3640 3645

Thr Ser Leu Ser Gly Tyr Arg Leu Lys Asp Cys Val Met Tyr Ala
 3650 3655 3660

Ser Ala Leu Val Leu Leu Ile Leu Met Thr Ala Arg Thr Val Tyr
 3665 3670 3675

Asp Asp Ala Ala Arg Arg Val Trp Thr Leu Met Asn Val Ile Thr
 3680 3685 3690

Leu Val Tyr Lys Val Tyr Tyr Gly Asn Ala Leu Asp Gln Ala Ile
 3695 3700 3705

Ser Met Trp Ala Leu Val Ile Ser Val Thr Ser Asn Tyr Ser Gly
 3710 3715 3720

Val Val Thr Thr Ile Met Phe Leu Ala Arg Ala Ile Val Phe Val
 3725 3730 3735

Cys Val Glu Tyr Tyr Pro Leu Leu Phe Ile Thr Gly Asn Thr Leu
 3740 3745 3750

Gln Cys Ile Met Leu Val Tyr Cys Phe Leu Gly Tyr Cys Cys Cys
 3755 3760 3765

Cys Tyr Phe Gly Leu Phe Cys Leu Leu Asn Arg Tyr Phe Arg Leu
 3770 3775 3780

Thr Leu Gly Val Tyr Asp Tyr Leu Val Ser Thr Gln Glu Phe Arg
 3785 3790 3795

Tyr Met Asn Ser Gln Gly Leu Leu Pro Pro Lys Ser Ser Ile Asp
 3800 3805 3810

Ala Phe Lys Leu Asn Ile Lys Leu Leu Gly Ile Gly Gly Lys Pro
 3815 3820 3825

Cys Ile Lys Val Ala Thr Val Gln Ser Lys Met Ser Asp Val Lys
 3830 3835 3840

Cys Thr Ser Val Val Leu Leu Ser Val Leu Gln Gln Leu Arg Val
 3845 3850 3855

Glu Ser Ser Ser Lys Leu Trp Ala Gln Cys Val Gln Leu His Asn
 3860 3865 3870

Asp Ile Leu Leu Ala Lys Asp Thr Thr Glu Ala Phe Glu Lys Met
 3875 3880 3885

Val Ser Leu Leu Ser Val Leu Leu Ser Met Gln Gly Ala Val Asp
 3890 3895 3900

Ile Asn Arg Leu Cys Glu Glu Met Leu Asp Asn Arg Ala Thr Leu
 3905 3910 3915

Gln Ala Ile Ala Ser Glu Phe Ser Ser Leu Pro Ser Tyr Ala Ala
 3920 3925 3930

Tyr Ala Thr Ala Gln Glu Ala Tyr Glu Gln Ala Val Ala Asn Gly
 3935 3940 3945

Asp Ser Glu Val Val Leu Lys Lys Leu Lys Lys Ser Leu Asn Val
 3950 3955 3960

Ala Lys Ser Glu Phe Asp Arg Asp Ala Ala Met Gln Arg Lys Leu
 3965 3970 3975

Glu Lys Met Ala Asp Gln Ala Met Thr Gln Met Tyr Lys Gln Ala
 3980 3985 3990

Arg Ser Glu Asp Lys Arg Ala Lys Val Thr Ser Ala Met Gln Thr
 3995 4000 4005

Met Leu Phe Thr Met Leu Arg Lys Leu Asp Asn Asp Ala Leu Asn
 4010 4015 4020

Asn Ile Ile Asn Asn Ala Arg Asp Gly Cys Val Pro Leu Asn Ile
 4025 4030 4035

Ile Pro Leu Thr Thr Ala Ala Lys Leu Met Val Val Val Pro Asp
 4040 4045 4050

Tyr Gly Thr Tyr Lys Asn Thr Cys Asp Gly Asn Thr Phe Thr Tyr

4055						4060						4065			
Ala	Ser	Ala	Leu	Trp	Glu	Ile	Gln	Gln	Val	Val	Asp	Ala	Asp	Ser	
4070						4075					4080				
Lys	Ile	Val	Gln	Leu	Ser	Glu	Ile	Asn	Met	Asp	Asn	Ser	Pro	Asn	
4085						4090					4095				
Leu	Ala	Trp	Pro	Leu	Ile	Val	Thr	Ala	Leu	Arg	Ala	Asn	Ser	Ala	
4100						4105					4110				
Val	Lys	Leu	Gln	Asn	Asn	Glu	Leu	Ser	Pro	Val	Ala	Leu	Arg	Gln	
4115						4120					4125				
Met	Ser	Cys	Ala	Ala	Gly	Thr	Thr	Gln	Thr	Ala	Cys	Thr	Asp	Asp	
4130						4135					4140				
Asn	Ala	Leu	Ala	Tyr	Tyr	Asn	Asn	Ser	Lys	Gly	Gly	Arg	Phe	Val	
4145						4150					4155				
Leu	Ala	Leu	Leu	Ser	Asp	His	Gln	Asp	Leu	Lys	Trp	Ala	Arg	Phe	
4160						4165					4170				
Pro	Lys	Ser	Asp	Gly	Thr	Gly	Thr	Ile	Tyr	Thr	Glu	Leu	Glu	Pro	
4175						4180					4185				
Pro	Cys	Arg	Phe	Val	Thr	Asp	Thr	Pro	Lys	Gly	Pro	Lys	Val	Lys	
4190						4195					4200				
Tyr	Leu	Tyr	Phe	Ile	Lys	Gly	Leu	Asn	Asn	Leu	Asn	Arg	Gly	Met	
4205						4210					4215				
Val	Leu	Gly	Ser	Leu	Ala	Ala	Thr	Val	Arg	Leu	Gln	Ala	Gly	Asn	
4220						4225					4230				
Ala	Thr	Glu	Val	Pro	Ala	Asn	Ser	Thr	Val	Leu	Ser	Phe	Cys	Ala	
4235						4240					4245				
Phe	Ala	Val	Asp	Pro	Ala	Lys	Ala	Tyr	Lys	Asp	Tyr	Leu	Ala	Ser	
4250						4255					4260				
Gly	Gly	Gln	Pro	Ile	Thr	Asn	Cys	Val	Lys	Met	Leu	Cys	Thr	His	
4265						4270					4275				

Thr	Gly	Thr	Gly	Gln	Ala	Ile	Thr	Val	Thr	Pro	Glu	Ala	Asn	Met
4280						4285					4290			
Asp	Gln	Glu	Ser	Phe	Gly	Gly	Ala	Ser	Cys	Cys	Leu	Tyr	Cys	Arg
4295						4300					4305			
Cys	His	Ile	Asp	His	Pro	Asn	Pro	Lys	Gly	Phe	Cys	Asp	Leu	Lys
4310						4315					4320			
Gly	Lys	Tyr	Val	Gln	Ile	Pro	Thr	Thr	Cys	Ala	Asn	Asp	Pro	Val
4325						4330					4335			
Gly	Phe	Thr	Leu	Arg	Asn	Thr	Val	Cys	Thr	Val	Cys	Gly	Met	Trp
4340						4345					4350			
Lys	Gly	Tyr	Gly	Cys	Ser	Cys	Asp	Gln	Leu	Arg	Glu	Pro	Leu	Met
4355						4360					4365			
Gln	Ser	Ala	Asp	Ala	Ser	Thr	Phe	Leu	Asn	Arg	Val	Cys	Gly	Val
4370						4375					4380			
Ser	Ala	Ala	Arg	Leu	Thr	Pro	Cys	Gly	Thr	Gly	Thr	Ser	Thr	Asp
4385						4390					4395			
Val	Val	Tyr	Arg	Ala	Phe	Asp	Ile	Tyr	Asn	Glu	Lys	Val	Ala	Gly
4400						4405					4410			
Phe	Ala	Lys	Phe	Leu	Lys	Thr	Asn	Cys	Cys	Arg	Phe	Gln	Glu	Lys
4415						4420					4425			
Asp	Glu	Glu	Gly	Asn	Leu	Leu	Asp	Ser	Tyr	Phe	Val	Val	Lys	Arg
4430						4435					4440			
His	Thr	Met	Ser	Asn	Tyr	Gln	His	Glu	Glu	Thr	Ile	Tyr	Asn	Leu
4445						4450					4455			
Val	Lys	Asp	Cys	Pro	Ala	Val	Ala	Val	His	Asp	Phe	Phe	Lys	Phe
4460						4465					4470			
Arg	Val	Asp	Gly	Asp	Met	Val	Pro	His	Ile	Ser	Arg	Gln	Arg	Leu
4475						4480					4485			
Thr	Lys	Tyr	Thr	Met	Ala	Asp	Leu	Val	Tyr	Ala	Leu	Arg	His	Phe
4490						4495					4500			

Asp	Glu	Gly	Asn	Cys	Asp	Thr	Leu	Lys	Glu	Ile	Leu	Val	Thr	Tyr
4505						4510					4515			
Asn	Cys	Cys	Asp	Asp	Asp	Tyr	Phe	Asn	Lys	Lys	Asp	Trp	Tyr	Asp
4520						4525					4530			
Phe	Val	Glu	Asn	Pro	Asp	Ile	Leu	Arg	Val	Tyr	Ala	Asn	Leu	Gly
4535						4540					4545			
Glu	Arg	Val	Arg	Gln	Ser	Leu	Leu	Lys	Thr	Val	Gln	Phe	Cys	Asp
4550						4555					4560			
Ala	Met	Arg	Asp	Ala	Gly	Ile	Val	Gly	Val	Leu	Thr	Leu	Asp	Asn
4565						4570					4575			
Gln	Asp	Leu	Asn	Gly	Asn	Trp	Tyr	Asp	Phe	Gly	Asp	Phe	Val	Gln
4580						4585					4590			
Val	Ala	Pro	Gly	Cys	Gly	Val	Pro	Ile	Val	Asp	Ser	Tyr	Tyr	Ser
4595						4600					4605			
Leu	Leu	Met	Pro	Ile	Leu	Thr	Leu	Thr	Arg	Ala	Leu	Ala	Ala	Glu
4610						4615					4620			
Ser	His	Met	Asp	Ala	Asp	Leu	Ala	Lys	Pro	Leu	Ile	Lys	Trp	Asp
4625						4630					4635			
Leu	Leu	Lys	Tyr	Asp	Phe	Thr	Glu	Glu	Arg	Leu	Cys	Leu	Phe	Asp
4640						4645					4650			
Arg	Tyr	Phe	Lys	Tyr	Trp	Asp	Gln	Thr	Tyr	His	Pro	Asn	Cys	Ile
4655						4660					4665			
Asn	Cys	Leu	Asp	Asp	Arg	Cys	Ile	Leu	His	Cys	Ala	Asn	Phe	Asn
4670						4675					4680			
Val	Leu	Phe	Ser	Thr	Val	Phe	Pro	Pro	Thr	Ser	Phe	Gly	Pro	Leu
4685						4690					4695			
Val	Arg	Lys	Ile	Phe	Val	Asp	Gly	Val	Pro	Phe	Val	Val	Ser	Thr
4700						4705					4710			
Gly	Tyr	His	Phe	Arg	Glu	Leu	Gly	Val	Val	His	Asn	Gln	Asp	Val
4715						4720					4725			

Asn Leu His Ser Ser Arg Leu Ser Phe Lys Glu Leu Leu Val Tyr
 4730 4735 4740

Ala Ala Asp Pro Ala Met His Ala Ala Ser Gly Asn Leu Leu Leu
 4745 4750 4755

Asp Lys Arg Thr Thr Cys Phe Ser Val Ala Ala Leu Thr Asn Asn
 4760 4765 4770

Val Ala Phe Gln Thr Val Lys Pro Gly Asn Phe Asn Lys Asp Phe
 4775 4780 4785

Tyr Asp Phe Ala Val Ser Lys Gly Phe Phe Lys Glu Gly Ser Ser
 4790 4795 4800

Val Glu Leu Lys His Phe Phe Phe Ala Gln Asp Gly Asn Ala Ala
 4805 4810 4815

Ile Ser Asp Tyr Asp Tyr Tyr Arg Tyr Asn Leu Pro Thr Met Cys
 4820 4825 4830

Asp Ile Arg Gln Leu Leu Phe Val Val Glu Val Val Asp Lys Tyr
 4835 4840 4845

Phe Asp Cys Tyr Asp Gly Gly Cys Ile Asn Ala Asn Gln Val Ile
 4850 4855 4860

Val Asn Asn Leu Asp Lys Ser Ala Gly Phe Pro Phe Asn Lys Trp
 4865 4870 4875

Gly Lys Ala Arg Leu Tyr Tyr Asp Ser Met Ser Tyr Glu Asp Gln
 4880 4885 4890

Asp Ala Leu Phe Ala Tyr Thr Lys Arg Asn Val Ile Pro Thr Ile
 4895 4900 4905

Thr Gln Met Asn Leu Lys Tyr Ala Ile Ser Ala Lys Asn Arg Ala
 4910 4915 4920

Arg Thr Val Ala Gly Val Ser Ile Cys Ser Thr Met Thr Asn Arg
 4925 4930 4935

Gln Phe His Gln Lys Leu Leu Lys Ser Ile Ala Ala Thr Arg Gly

4940		4945		4950
Ala Thr Val Val Ile Gly Thr Ser Lys Phe Tyr Gly Gly Trp His				
4955		4960		4965
Asn Met Leu Lys Thr Val Tyr Ser Asp Val Glu Thr Pro His Leu				
4970		4975		4980
Met Gly Trp Asp Tyr Pro Lys Cys Asp Arg Ala Met Pro Asn Met				
4985		4990		4995
Leu Arg Ile Met Ala Ser Leu Val Leu Ala Arg Lys His Asn Thr				
5000		5005		5010
Cys Cys Asn Leu Ser His Arg Phe Tyr Arg Leu Ala Asn Glu Cys				
5015		5020		5025
Ala Gln Val Leu Ser Glu Met Val Met Cys Gly Gly Ser Leu Tyr				
5030		5035		5040
Val Lys Pro Gly Gly Thr Ser Ser Gly Asp Ala Thr Thr Ala Tyr				
5045		5050		5055
Ala Asn Ser Val Phe Asn Ile Cys Gln Ala Val Thr Ala Asn Val				
5060		5065		5070
Asn Ala Leu Leu Ser Thr Asp Gly Asn Lys Ile Ala Asp Lys Tyr				
5075		5080		5085
Val Arg Asn Leu Gln His Arg Leu Tyr Glu Cys Leu Tyr Arg Asn				
5090		5095		5100
Arg Asp Val Asp His Glu Phe Val Asp Glu Phe Tyr Ala Tyr Leu				
5105		5110		5115
Arg Lys His Phe Ser Met Met Ile Leu Ser Asp Asp Ala Val Val				
5120		5125		5130
Cys Tyr Asn Ser Asn Tyr Ala Ala Gln Gly Leu Val Ala Ser Ile				
5135		5140		5145
Lys Asn Phe Lys Ala Val Leu Tyr Tyr Gln Asn Asn Val Phe Met				
5150		5155		5160

Ser Glu Ala Lys Cys Trp Thr Glu Thr Asp Leu Thr Lys Gly Pro
5165 5170 5175

His Glu Phe Cys Ser Gln His Thr Met Leu Val Lys Gln Gly Asp
5180 5185 5190

Asp Tyr Val Tyr Leu Pro Tyr Pro Asp Pro Ser Arg Ile Leu Gly
5195 5200 5205

Ala Gly Cys Phe Val Asp Asp Ile Val Lys Thr Asp Gly Thr Leu
5210 5215 5220

Met Ile Glu Arg Phe Val Ser Leu Ala Ile Asp Ala Tyr Pro Leu
5225 5230 5235

Thr Lys His Pro Asn Gln Glu Tyr Ala Asp Val Phe His Leu Tyr
5240 5245 5250

Leu Gln Tyr Ile Arg Lys Leu His Asp Glu Leu Thr Gly His Met
5255 5260 5265

Leu Asp Met Tyr Ser Val Met Leu Thr Asn Asp Asn Thr Ser Arg
5270 5275 5280

Tyr Trp Glu Pro Glu Phe Tyr Glu Ala Met Tyr Thr Pro His Thr
5285 5290 5295

Val Leu Gln Ala Val Gly Ala Cys Val Leu Cys Asn Ser Gln Thr
5300 5305 5310

Ser Leu Arg Cys Gly Ala Cys Ile Arg Arg Pro Phe Leu Cys Cys
5315 5320 5325

Lys Cys Cys Tyr Asp His Val Ile Ser Thr Ser His Lys Leu Val
5330 5335 5340

Leu Ser Val Asn Pro Tyr Val Cys Asn Ala Pro Gly Cys Asp Val
5345 5350 5355

Thr Asp Val Thr Gln Leu Tyr Leu Gly Gly Met Ser Tyr Tyr Cys
5360 5365 5370

Lys Ser His Lys Pro Pro Ile Ser Phe Pro Leu Cys Ala Asn Gly
5375 5380 5385

Gln	Val	Phe	Gly	Leu	Tyr	Lys	Asn	Thr	Cys	Val	Gly	Ser	Asp	Asn
5390						5395					5400			
Val	Thr	Asp	Phe	Asn	Ala	Ile	Ala	Thr	Cys	Asp	Trp	Thr	Asn	Ala
5405						5410					5415			
Gly	Asp	Tyr	Ile	Leu	Ala	Asn	Thr	Cys	Thr	Glu	Arg	Leu	Lys	Leu
5420						5425					5430			
Phe	Ala	Ala	Glu	Thr	Leu	Lys	Ala	Thr	Glu	Glu	Thr	Phe	Lys	Leu
5435						5440					5445			
Ser	Tyr	Gly	Ile	Ala	Thr	Val	Arg	Glu	Val	Leu	Ser	Asp	Arg	Glu
5450						5455					5460			
Leu	His	Leu	Ser	Trp	Glu	Val	Gly	Lys	Pro	Arg	Pro	Pro	Leu	Asn
5465						5470					5475			
Arg	Asn	Tyr	Val	Phe	Thr	Gly	Tyr	Arg	Val	Thr	Lys	Asn	Ser	Lys
5480						5485					5490			
Val	Gln	Ile	Gly	Glu	Tyr	Thr	Phe	Glu	Lys	Gly	Asp	Tyr	Gly	Asp
5495						5500					5505			
Ala	Val	Val	Tyr	Arg	Gly	Thr	Thr	Thr	Tyr	Lys	Leu	Asn	Val	Gly
5510						5515					5520			
Asp	Tyr	Phe	Val	Leu	Thr	Ser	His	Thr	Val	Met	Pro	Leu	Ser	Ala
5525						5530					5535			
Pro	Thr	Leu	Val	Pro	Gln	Glu	His	Tyr	Val	Arg	Ile	Thr	Gly	Leu
5540						5545					5550			
Tyr	Pro	Thr	Leu	Asn	Ile	Ser	Asp	Glu	Phe	Ser	Ser	Asn	Val	Ala
5555						5560					5565			
Asn	Tyr	Gln	Lys	Val	Gly	Met	Gln	Lys	Tyr	Ser	Thr	Leu	Gln	Gly
5570						5575					5580			
Pro	Pro	Gly	Thr	Gly	Lys	Ser	His	Phe	Ala	Ile	Gly	Leu	Ala	Leu
5585						5590					5595			
Tyr	Tyr	Pro	Ser	Ala	Arg	Ile	Val	Tyr	Thr	Ala	Cys	Ser	His	Ala
5600						5605					5610			

Ala	Val	Asp	Ala	Leu	Cys	Glu	Lys	Ala	Ser	Lys	Tyr	Leu	Pro	Ile
5615						5620					5625			
Asp	Lys	Cys	Ser	Arg	Ile	Ile	Pro	Ala	Arg	Ala	Arg	Val	Glu	Cys
5630						5635					5640			
Phe	Asp	Lys	Phe	Lys	Val	Asn	Ser	Thr	Leu	Glu	Gln	Tyr	Val	Phe
5645						5650					5655			
Cys	Thr	Val	Asn	Ala	Leu	Pro	Glu	Thr	Thr	Ala	Asp	Ile	Val	Val
5660						5665					5670			
Phe	Asp	Glu	Ile	Ser	Met	Ala	Thr	Asn	Tyr	Asp	Leu	Ser	Val	Val
5675						5680					5685			
Asn	Ala	Arg	Leu	Arg	Ala	Lys	His	Tyr	Val	Tyr	Ile	Gly	Asp	Pro
5690						5695					5700			
Ala	Gln	Leu	Pro	Ala	Pro	Arg	Thr	Leu	Leu	Thr	Lys	Gly	Thr	Leu
5705						5710					5715			
Glu	Pro	Glu	Tyr	Phe	Asn	Ser	Val	Cys	Arg	Leu	Met	Lys	Thr	Ile
5720						5725					5730			
Gly	Pro	Asp	Met	Phe	Leu	Gly	Thr	Cys	Arg	Arg	Cys	Pro	Ala	Glu
5735						5740					5745			
Ile	Val	Asp	Thr	Val	Ser	Ala	Leu	Val	Tyr	Asp	Asn	Lys	Leu	Lys
5750						5755					5760			
Ala	His	Lys	Glu	Lys	Ser	Ala	Gln	Cys	Phe	Lys	Met	Phe	Tyr	Lys
5765						5770					5775			
Gly	Val	Ile	Thr	His	Asp	Val	Ser	Ser	Ala	Ile	Asn	Arg	Pro	Gln
5780						5785					5790			
Ile	Gly	Val	Val	Arg	Glu	Phe	Leu	Thr	Arg	Asn	Pro	Ala	Trp	Arg
5795						5800					5805			
Lys	Ala	Val	Phe	Ile	Ser	Pro	Tyr	Asn	Ser	Gln	Asn	Ala	Val	Ala
5810						5815					5820			
Ser	Lys	Ile	Leu	Gly	Leu	Pro	Thr	Gln	Thr	Val	Asp	Ser	Ser	Gln

5825		5830		5835
Gly Ser Glu Tyr Asp Tyr Val Ile Phe Thr Gln Thr Thr Glu Thr				
5840		5845		5850
Ala His Ser Cys Asn Val Asn Arg Phe Asn Val Ala Ile Thr Arg				
5855		5860		5865
Ala Lys Ile Gly Ile Leu Cys Ile Met Ser Asp Arg Asp Leu Tyr				
5870		5875		5880
Asp Lys Leu Gln Phe Thr Ser Leu Glu Ile Pro Arg Arg Asn Val				
5885		5890		5895
Ala Thr Leu Gln Ala Glu Asn Val Thr Gly Leu Phe Lys Asp Cys				
5900		5905		5910
Ser Lys Ile Ile Thr Gly Leu His Pro Thr Gln Ala Pro Thr His				
5915		5920		5925
Leu Ser Val Asp Ile Lys Phe Lys Thr Glu Gly Leu Cys Val Asp				
5930		5935		5940
Ile Pro Gly Ile Pro Lys Asp Met Thr Tyr Arg Arg Leu Ile Ser				
5945		5950		5955
Met Met Gly Phe Lys Met Asn Tyr Gln Val Asn Gly Tyr Pro Asn				
5960		5965		5970
Met Phe Ile Thr Arg Glu Glu Ala Ile Arg His Val Arg Ala Trp				
5975		5980		5985
Ile Gly Phe Asp Val Glu Gly Cys His Ala Thr Arg Asp Ala Val				
5990		5995		6000
Gly Thr Asn Leu Pro Leu Gln Leu Gly Phe Ser Thr Gly Val Asn				
6005		6010		6015
Leu Val Ala Val Pro Thr Gly Tyr Val Asp Thr Glu Asn Asn Thr				
6020		6025		6030
Glu Phe Thr Arg Val Asn Ala Lys Pro Pro Pro Gly Asp Gln Phe				
6035		6040		6045

Lys	His	Leu	Ile	Pro	Leu	Met	Tyr	Lys	Gly	Leu	Pro	Trp	Asn	Val
6050						6055					6060			
Val	Arg	Ile	Lys	Ile	Val	Gln	Met	Leu	Ser	Asp	Thr	Leu	Lys	Gly
6065						6070					6075			
Leu	Ser	Asp	Arg	Val	Val	Phe	Val	Leu	Trp	Ala	His	Gly	Phe	Glu
6080						6085					6090			
Leu	Thr	Ser	Met	Lys	Tyr	Phe	Val	Lys	Ile	Gly	Pro	Glu	Arg	Thr
6095						6100					6105			
Cys	Cys	Leu	Cys	Asp	Lys	Arg	Ala	Thr	Cys	Phe	Ser	Thr	Ser	Ser
6110						6115					6120			
Asp	Thr	Tyr	Ala	Cys	Trp	Asn	His	Ser	Val	Gly	Phe	Asp	Tyr	Val
6125						6130					6135			
Tyr	Asn	Pro	Phe	Met	Ile	Asp	Val	Gln	Gln	Trp	Gly	Phe	Thr	Gly
6140						6145					6150			
Asn	Leu	Gln	Ser	Asn	His	Asp	Gln	His	Cys	Gln	Val	His	Gly	Asn
6155						6160					6165			
Ala	His	Val	Ala	Ser	Cys	Asp	Ala	Ile	Met	Thr	Arg	Cys	Leu	Ala
6170						6175					6180			
Val	His	Glu	Cys	Phe	Val	Lys	Arg	Val	Asp	Trp	Ser	Val	Glu	Tyr
6185						6190					6195			
Pro	Ile	Ile	Gly	Asp	Glu	Leu	Arg	Val	Asn	Ser	Ala	Cys	Arg	Lys
6200						6205					6210			
Val	Gln	His	Met	Val	Val	Lys	Ser	Ala	Leu	Leu	Ala	Asp	Lys	Phe
6215						6220					6225			
Pro	Val	Leu	His	Asp	Ile	Gly	Asn	Pro	Lys	Ala	Ile	Lys	Cys	Val
6230						6235					6240			
Pro	Gln	Ala	Glu	Val	Glu	Trp	Lys	Phe	Tyr	Asp	Ala	Gln	Pro	Cys
6245						6250					6255			
Ser	Asp	Lys	Ala	Tyr	Lys	Ile	Glu	Glu	Leu	Phe	Tyr	Ser	Tyr	Ala
6260						6265					6270			

Thr	His	His	Asp	Lys	Phe	Thr	Asp	Gly	Val	Cys	Leu	Phe	Trp	Asn
6275						6280					6285			
Cys	Asn	Val	Asp	Arg	Tyr	Pro	Ala	Asn	Ala	Ile	Val	Cys	Arg	Phe
6290						6295					6300			
Asp	Thr	Arg	Val	Leu	Ser	Asn	Leu	Asn	Leu	Pro	Gly	Cys	Asp	Gly
6305						6310					6315			
Gly	Ser	Leu	Tyr	Val	Asn	Lys	His	Ala	Phe	His	Thr	Pro	Ala	Phe
6320						6325					6330			
Asp	Lys	Ser	Ala	Phe	Thr	Asn	Leu	Lys	Gln	Leu	Pro	Phe	Phe	Tyr
6335						6340					6345			
Tyr	Ser	Asp	Ser	Pro	Cys	Glu	Ser	His	Gly	Lys	Gln	Val	Val	Ser
6350						6355					6360			
Asp	Ile	Asp	Tyr	Val	Pro	Leu	Lys	Ser	Ala	Thr	Cys	Ile	Thr	Arg
6365						6370					6375			
Cys	Asn	Leu	Gly	Gly	Ala	Val	Cys	Arg	His	His	Ala	Asn	Glu	Tyr
6380						6385					6390			
Arg	Gln	Tyr	Leu	Asp	Ala	Tyr	Asn	Met	Met	Ile	Ser	Ala	Gly	Phe
6395						6400					6405			
Ser	Leu	Trp	Ile	Tyr	Lys	Gln	Phe	Asp	Thr	Tyr	Asn	Leu	Trp	Asn
6410						6415					6420			
Thr	Phe	Thr	Arg	Leu	Gln	Ser	Leu	Glu	Asn	Val	Ala	Tyr	Asn	Val
6425						6430					6435			
Val	Asn	Lys	Gly	His	Phe	Asp	Gly	His	Ala	Gly	Glu	Ala	Pro	Val
6440						6445					6450			
Ser	Ile	Ile	Asn	Asn	Ala	Val	Tyr	Thr	Lys	Val	Asp	Gly	Ile	Asp
6455						6460					6465			
Val	Glu	Ile	Phe	Glu	Asn	Lys	Thr	Thr	Leu	Pro	Val	Asn	Val	Ala
6470						6475					6480			
Phe	Glu	Leu	Trp	Ala	Lys	Arg	Asn	Ile	Lys	Pro	Val	Pro	Glu	Ile
6485						6490					6495			

Lys	Ile	Leu	Asn	Asn	Leu	Gly	Val	Asp	Ile	Ala	Ala	Asn	Thr	Val
6500						6505					6510			
Ile	Trp	Asp	Tyr	Lys	Arg	Glu	Ala	Pro	Ala	His	Val	Ser	Thr	Ile
6515						6520					6525			
Gly	Val	Cys	Thr	Met	Thr	Asp	Ile	Ala	Lys	Lys	Pro	Thr	Glu	Ser
6530						6535					6540			
Ala	Cys	Ser	Ser	Leu	Thr	Val	Leu	Phe	Asp	Gly	Arg	Val	Glu	Gly
6545						6550					6555			
Gln	Val	Asp	Leu	Phe	Arg	Asn	Ala	Arg	Asn	Gly	Val	Leu	Ile	Thr
6560						6565					6570			
Glu	Gly	Ser	Val	Lys	Gly	Leu	Thr	Pro	Ser	Lys	Gly	Pro	Ala	Gln
6575						6580					6585			
Ala	Ser	Val	Asn	Gly	Val	Thr	Leu	Ile	Gly	Glu	Ser	Val	Lys	Thr
6590						6595					6600			
Gln	Phe	Asn	Tyr	Phe	Lys	Lys	Val	Asp	Gly	Ile	Ile	Gln	Gln	Leu
6605						6610					6615			
Pro	Glu	Thr	Tyr	Phe	Thr	Gln	Ser	Arg	Asp	Leu	Glu	Asp	Phe	Lys
6620						6625					6630			
Pro	Arg	Ser	Gln	Met	Glu	Thr	Asp	Phe	Leu	Glu	Leu	Ala	Met	Asp
6635						6640					6645			
Glu	Phe	Ile	Gln	Arg	Tyr	Lys	Leu	Glu	Gly	Tyr	Ala	Phe	Glu	His
6650						6655					6660			
Ile	Val	Tyr	Gly	Asp	Phe	Ser	His	Gly	Gln	Leu	Gly	Gly	Leu	His
6665						6670					6675			
Leu	Met	Ile	Gly	Leu	Ala	Lys	Arg	Ser	Gln	Asp	Ser	Pro	Leu	Lys
6680						6685					6690			
Leu	Glu	Asp	Phe	Ile	Pro	Met	Asp	Ser	Thr	Val	Lys	Asn	Tyr	Phe
6695						6700					6705			
Ile	Thr	Asp	Ala	Gln	Thr	Gly	Ser	Ser	Lys	Cys	Val	Cys	Ser	Val

6710		6715		6720
Ile Asp Leu Leu Leu Asp Asp Phe Val Glu Ile Ile Lys Ser Gln				
6725		6730		6735
Asp Leu Ser Val Ile Ser Lys Val Val Lys Val Thr Ile Asp Tyr				
6740		6745		6750
Ala Glu Ile Ser Phe Met Leu Trp Cys Lys Asp Gly His Val Glu				
6755		6760		6765
Thr Phe Tyr Pro Lys Leu Gln Ala Ser Gln Ala Trp Gln Pro Gly				
6770		6775		6780
Val Ala Met Pro Asn Leu Tyr Lys Met Gln Arg Met Leu Leu Glu				
6785		6790		6795
Lys Cys Asp Leu Gln Asn Tyr Gly Glu Asn Ala Val Ile Pro Lys				
6800		6805		6810
Gly Ile Met Met Asn Val Ala Lys Tyr Thr Gln Leu Cys Gln Tyr				
6815		6820		6825
Leu Asn Thr Leu Thr Leu Ala Val Pro Tyr Asn Met Arg Val Ile				
6830		6835		6840
His Phe Gly Ala Gly Ser Asp Lys Gly Val Ala Pro Gly Thr Ala				
6845		6850		6855
Val Leu Arg Gln Trp Leu Pro Thr Gly Thr Leu Leu Val Asp Ser				
6860		6865		6870
Asp Leu Asn Asp Phe Val Ser Asp Ala Asp Ser Thr Leu Ile Gly				
6875		6880		6885
Asp Cys Ala Thr Val His Thr Ala Asn Lys Trp Asp Leu Ile Ile				
6890		6895		6900
Ser Asp Met Tyr Asp Pro Lys Thr Lys His Val Thr Lys Glu Asn				
6905		6910		6915
Asp Ser Lys Glu Gly Phe Phe Thr Tyr Leu Cys Gly Phe Ile Lys				
6920		6925		6930

Gln Lys Leu Ala Leu Gly Gly Ser Ile Ala Val Lys Ile Thr Glu
6935 6940 6945

His Ser Trp Asn Ala Asp Leu Tyr Lys Leu Met Gly His Phe Ser
6950 6955 6960

Trp Trp Thr Ala Phe Val Thr Asn Val Asn Ala Ser Ser Ser Glu
6965 6970 6975

Ala Phe Leu Ile Gly Ala Asn Tyr Leu Gly Lys Pro Lys Glu Gln
6980 6985 6990

Ile Asp Gly Tyr Thr Met His Ala Asn Tyr Ile Phe Trp Arg Asn
6995 7000 7005

Thr Asn Pro Ile Gln Leu Ser Ser Tyr Ser Leu Phe Asp Met Ser
7010 7015 7020

Lys Phe Pro Leu Lys Leu Arg Gly Thr Ala Val Met Ser Leu Lys
7025 7030 7035

Glu Asn Gln Ile Asn Asp Met Ile Tyr Ser Leu Leu Glu Lys Gly
7040 7045 7050

Arg Leu Ile Ile Arg Glu Asn Asn Arg Val Val Val Ser Ser Asp
7055 7060 7065

Ile Leu Val Asn Asn
7070

<210> 9
<211> 653
<212> PRT
<213> SARS Coronaviruses (SARS-CoV)

<400> 9

Met Phe Ile Phe Leu Leu Phe Leu Thr Leu Thr Ser Gly Ser Asp Leu
1 5 10 15

Asp Arg Cys Thr Thr Phe Asp Asp Val Gln Ala Pro Asn Tyr Thr Gln
20 25 30

His Thr Ser Ser Met Arg Gly Val Tyr Tyr Pro Asp Glu Ile Phe Arg
35 40 45

Ser Asp Thr Leu Tyr Leu Thr Gln Asp Leu Phe Leu Pro Phe Tyr Ser
 50 55 60

Asn Val Thr Gly Phe His Thr Ile Asn His Thr Phe Asp Asn Pro Val
 65 70 75 80

Ile Pro Phe Lys Asp Gly Ile Tyr Phe Ala Ala Thr Glu Lys Ser Asn
 85 90 95

Val Val Arg Gly Trp Val Phe Gly Ser Thr Met Asn Asn Lys Ser Gln
 100 105 110

Ser Val Ile Ile Ile Asn Asn Ser Thr Asn Val Val Ile Arg Ala Arg
 115 120 125

Ser Phe Glu Leu Cys Asp Asn Pro Phe Phe Ala Val Ser Lys Pro Met
 130 135 140

Gly Thr Gln Thr His Thr Met Ile Phe Asp Asn Ala Phe Asn Cys Thr
 145 150 155 160

Phe Glu Tyr Ile Ser Asp Ala Leu Ser Leu Asp Val Ser Glu Lys Ser
 165 170 175

Gly Asn Phe Lys His Leu Arg Glu Phe Val Phe Lys Asn Lys Asp Gly
 180 185 190

Phe Leu Tyr Val Tyr Lys Gly Tyr Gln Pro Ile Asp Val Val Arg Asp
 195 200 205

Leu Pro Ser Gly Phe Asn Thr Leu Lys Pro Ile Phe Lys Leu Pro Leu
 210 215 220

Gly Ile Asn Ile Thr Asn Phe Arg Ala Ile Leu Thr Ala Phe Leu Pro
 225 230 235 240

Ala Gln Asp Thr Trp Gly Thr Ser Ala Ala Ala Tyr Phe Val Gly Tyr
 245 250 255

Leu Lys Pro Thr Thr Phe Met Leu Lys Tyr Asp Glu Asn Gly Thr Ile
 260 265 270

Thr Asp Ala Val Asp Cys Ser Gln Asn Pro Leu Ala Glu Leu Lys Cys
 275 280 285

Ser Val Lys Ser Phe Glu Ile Asp Lys Gly Ile Tyr Gln Thr Ser Asn
290 295 300

Phe Arg Val Val Pro Ser Arg Asp Val Val Arg Phe Pro Asn Ile Thr
305 310 315 320

Asn Leu Cys Pro Phe Gly Glu Val Phe Asn Ala Thr Lys Phe Pro Ser
325 330 335

Val Tyr Ala Trp Val Arg Lys Arg Ile Ser Asn Cys Val Ala Asp Tyr
340 345 350

Ser Val Leu Tyr Asn Ser Thr Phe Phe Ser Thr Phe Lys Cys Tyr Gly
355 360 365

Val Ser Ala Thr Lys Leu Asn Asp Leu Cys Phe Ser Asn Val Tyr Ala
370 375 380

Asp Ser Phe Val Val Lys Gly Asp Asp Val Arg Gln Ile Ala Pro Gly
385 390 395 400

Gln Thr Gly Val Ile Ala Asp Tyr Asn Tyr Lys Leu Pro Asp Asp Phe
405 410 415

Met Gly Cys Val Leu Ala Trp Asn Thr Arg Asn Ile Asp Ala Thr Ser
420 425 430

Thr Gly Asn Tyr Asn Tyr Lys Tyr Arg Tyr Leu Arg His Gly Lys Leu
435 440 445

Arg Pro Phe Glu Arg Asp Ile Ser Asn Val Pro Phe Ser Pro Asp Gly
450 455 460

Lys Pro Cys Thr Pro Pro Ala Leu Asn Cys Tyr Trp Pro Leu Asn Asp
465 470 475 480

Tyr Gly Phe Tyr Thr Thr Thr Gly Ile Gly Tyr Gln Pro Tyr Arg Val
485 490 495

Val Val Leu Ser Phe Glu Leu Leu Asn Ala Pro Ala Thr Val Cys Gly
500 505 510

Pro Lys Leu Ser Thr Asp Leu Ile Lys Asn Gln Cys Val Asn Phe Asn
515 520 525

Phe Asn Gly Leu Thr Gly Thr Gly Val Leu Thr Pro Ser Ser Lys Arg
530 535 540

Phe Gln Pro Phe Gln Gln Phe Gly Arg Asp Val Ser Asp Phe Thr Asp
545 550 555 560

Ser Val Arg Asp Pro Lys Thr Ser Glu Ile Leu Asp Ile Ser Pro Cys
565 570 575

Ser Phe Gly Gly Val Ser Val Ile Thr Pro Gly Thr Asn Ala Ser Ser
580 585 590

Glu Val Ala Val Leu Tyr Gln Asp Val Asn Cys Thr Asp Val Ser Thr
595 600 605

Ala Ile His Ala Asp Gln Leu Thr Pro Ala Trp Arg Ile Tyr Ser Thr
610 615 620

Gly Asn Asn Val Phe Gln Thr Gln Ala Gly Cys Leu Ile Gly Ala Glu
625 630 635 640

His Val Asp Thr Ser Tyr Glu Cys Asp Ile Pro Ile Gly
645 650

<210> 10
<211> 623
<212> PRT
<213> SARS Coronaviruses (SARS-CoV)

<400> 10

Met Gly Cys Leu Ile Gly Ala Glu His Val Asp Thr Ser Tyr Glu Cys
1 5 10 15

Asp Ile Pro Ile Gly Ala Gly Ile Cys Ala Ser Tyr His Thr Val Ser
20 25 30

Leu Leu Arg Ser Thr Ser Gln Lys Ser Ile Val Ala Tyr Thr Met Ser
35 40 45

Leu Gly Ala Asp Ser Ser Ile Ala Tyr Ser Asn Asn Thr Ile Ala Ile
50 55 60

Pro Thr Asn Phe Ser Ile Ile Ile Thr Thr Glu Val Met Pro Val Ser
65 70 75 80

Met Ala Lys Thr Ser Val Asp Cys Asn Met Tyr Ile Cys Gly Asp Ser
 85 90 95

Thr Glu Cys Ala Asn Leu Leu Leu Gln Tyr Gly Ser Phe Cys Thr Gln
 100 105 110

Leu Asn Arg Ala Leu Ser Gly Ile Ala Ala Glu Gln Asp Arg Asn Thr
 115 120 125

Arg Glu Val Phe Ala Gln Val Lys Gln Met Tyr Lys Thr Pro Thr Leu
 130 135 140

Glu Asp Phe Gly Gly Phe Asn Phe Ser Gln Ile Leu Pro Asp Pro Leu
 145 150 155 160

Lys Leu Thr Lys Arg Ser Phe Ile Glu Asp Leu Leu Phe Asn Lys Val
 165 170 175

Thr Leu Ala Asp Ala Gly Phe Met Lys Gln Tyr Gly Glu Cys Leu Gly
 180 185 190

Asp Ile Asn Ala Arg Asp Leu Ile Cys Ala Gln Lys Phe Asn Gly Leu
 195 200 205

Thr Val Leu Pro Pro Leu Leu Thr Asp Asp Met Ile Ala Ala Tyr Thr
 210 215 220

Ala Ala Leu Val Ser Gly Thr Val Thr Ala Gly Trp Thr Phe Gly Ala
 225 230 235 240

Gly Ala Ala Leu Gln Ile Pro Phe Ala Met Gln Met Ala Tyr Arg Phe
 245 250 255

Asn Gly Ile Gly Val Thr Gln Asn Val Leu Tyr Glu Asn Gln Lys Gln
 260 265 270

Ile Ala Asn Gln Phe Asn Lys Ala Ile Ser Gln Ile Gln Glu Ser Leu
 275 280 285

Thr Thr Thr Ser Thr Ala Leu Gly Lys Leu Gln Asp Val Val Asn Gln
 290 295 300

Asn Ala Gln Ala Leu Asn Thr Leu Val Lys Gln Leu Ser Ser Asn Phe

305		310		315		320									
Gly	Ala	Ile	Ser	Ser	Val	Leu	Asn	Asp	Ile	Leu	Ser	Arg	Leu	Asp	Lys
			325						330					335	
Val	Glu	Ala	Glu	Val	Gln	Ile	Asp	Arg	Leu	Ile	Thr	Gly	Arg	Leu	Gln
			340					345					350		
Ser	Leu	Gln	Thr	Tyr	Val	Thr	Gln	Gln	Leu	Ile	Arg	Ala	Ala	Glu	Ile
		355					360					365			
Arg	Ala	Ser	Ala	Asn	Leu	Ala	Ala	Thr	Lys	Met	Ser	Glu	Cys	Val	Leu
	370					375					380				
Gly	Gln	Ser	Lys	Arg	Val	Asp	Phe	Cys	Gly	Lys	Gly	Tyr	His	Leu	Met
385					390					395					400
Ser	Phe	Pro	Gln	Ala	Ala	Pro	His	Gly	Val	Val	Phe	Leu	His	Val	Met
			405						410					415	
Tyr	Val	Pro	Ser	Gln	Glu	Arg	Asn	Phe	Thr	Thr	Ala	Pro	Ala	Ile	Cys
			420					425					430		
His	Glu	Gly	Lys	Ala	Tyr	Phe	Pro	Arg	Glu	Gly	Val	Phe	Val	Phe	Asn
		435					440					445			
Gly	Thr	Ser	Trp	Phe	Thr	Thr	Gln	Arg	Asn	Phe	Phe	Ser	Pro	Gln	Ile
	450					455					460				
Ile	Thr	Thr	Asp	Asn	Thr	Phe	Val	Ser	Gly	Asn	Cys	Asp	Val	Val	Ile
465					470					475					480
Gly	Ile	Ile	Asn	Asn	Thr	Val	Tyr	Asp	Pro	Leu	Gln	Pro	Glu	Leu	Asp
			485						490					495	
Ser	Phe	Lys	Glu	Glu	Leu	Asp	Lys	Tyr	Phe	Lys	Asn	His	Thr	Ser	Pro
			500					505					510		
Asp	Val	Asp	Leu	Gly	Asp	Ile	Ser	Gly	Ile	Asn	Ala	Ser	Val	Val	Asn
		515					520					525			
Ile	Gln	Glu	Glu	Ile	Asp	Arg	Leu	Asn	Glu	Val	Ala	Lys	Asn	Leu	Asn
	530					535					540				

Glu Ser Leu Ile Asp Leu Gln Glu Leu Gly Lys Tyr Glu Gln Tyr Ile
545 550 555 560

Lys Trp Pro Trp Tyr Val Trp Leu Gly Phe Ile Ala Gly Leu Ile Ala
565 570 575

Ile Val Met Val Thr Ile Leu Leu Cys Cys Met Thr Ser Cys Cys Ser
580 585 590

Cys Leu Lys Gly Ala Cys Ser Cys Gly Ser Cys Cys Lys Phe Asp Glu
595 600 605

Asp Asp Ser Glu Pro Val Leu Lys Gly Val Lys Leu His Tyr Thr
610 615 620

<210> 11
<211> 76
<212> PRT
<213> SARS Coronaviruses (SARS-CoV)

<400> 11

Met Tyr Ser Phe Val Ser Glu Glu Thr Gly Thr Leu Ile Val Asn Ser
1 5 10 15

Val Leu Leu Phe Leu Ala Phe Val Val Phe Leu Leu Val Thr Leu Ala
20 25 30

Ile Leu Thr Ala Leu Arg Leu Cys Ala Tyr Cys Cys Asn Ile Val Asn
35 40 45

Val Ser Leu Val Lys Pro Thr Val Tyr Val Tyr Ser Arg Val Lys Asn
50 55 60

Leu Asn Ser Ser Glu Gly Val Pro Asp Leu Leu Val
65 70 75

<210> 12
<211> 221
<212> PRT
<213> SARS Coronaviruses (SARS-CoV)

<400> 12

Met Ala Asp Asn Gly Thr Ile Thr Val Glu Glu Leu Lys Gln Leu Leu
1 5 10 15

Glu Gln Trp Asn Leu Val Ile Gly Phe Leu Phe Leu Ala Trp Ile Met

20					25					30					
Leu	Leu	Gln	Phe	Ala	Tyr	Ser	Asn	Arg	Asn	Arg	Phe	Leu	Tyr	Ile	Ile
		35					40					45			
Lys	Leu	Val	Phe	Leu	Trp	Leu	Leu	Trp	Pro	Val	Thr	Leu	Ala	Cys	Phe
	50					55					60				
Val	Leu	Ala	Ala	Val	Tyr	Arg	Ile	Asn	Trp	Val	Thr	Gly	Gly	Ile	Ala
65					70					75					80
Ile	Ala	Met	Ala	Cys	Ile	Val	Gly	Leu	Met	Trp	Leu	Ser	Tyr	Phe	Val
				85					90					95	
Ala	Ser	Phe	Arg	Leu	Phe	Ala	Arg	Thr	Arg	Ser	Met	Trp	Ser	Phe	Asn
			100					105					110		
Pro	Glu	Thr	Asn	Ile	Leu	Leu	Asn	Val	Pro	Leu	Arg	Gly	Thr	Ile	Val
		115					120					125			
Thr	Arg	Pro	Leu	Met	Glu	Ser	Glu	Leu	Val	Ile	Gly	Ala	Val	Ile	Ile
	130					135					140				
Arg	Gly	His	Leu	Arg	Met	Ala	Gly	His	Ser	Leu	Gly	Arg	Cys	Asp	Ile
145					150					155					160
Lys	Asp	Leu	Pro	Lys	Glu	Ile	Thr	Val	Ala	Thr	Ser	Arg	Thr	Leu	Ser
				165					170					175	
Tyr	Tyr	Lys	Leu	Gly	Ala	Ser	Gln	Arg	Val	Gly	Thr	Asp	Ser	Gly	Phe
			180					185					190		
Ala	Ala	Tyr	Asn	Arg	Tyr	Arg	Ile	Gly	Asn	Tyr	Lys	Leu	Asn	Thr	Asp
		195					200					205			
His	Ala	Gly	Ser	Asn	Asp	Asn	Ile	Ala	Leu	Leu	Val	Gln			
	210					215					220				

<210> 13
 <211> 398
 <212> PRT
 <213> SARS Coronaviruses (SARS-CoV)

<400> 13

Met Asp Asn Asn Gln Asn Gly Gly Arg Asn Gly Ala Arg Pro Lys Gln

1		5				10			15						
Arg	Arg	Pro	Gln	Gly	Leu	Pro	Asn	Asn	Thr	Ala	Ser	Trp	Phe	Thr	Ala
		20					25						30		
Leu	Thr	Gln	His	Gly	Lys	Glu	Glu	Leu	Arg	Phe	Pro	Arg	Gly	Gln	Gly
		35				40					45				
Val	Pro	Ile	Asn	Thr	Asn	Ser	Gly	Pro	Asp	Asp	Gln	Ile	Gly	Tyr	Tyr
50					55						60				
Arg	Arg	Ala	Thr	Arg	Arg	Val	Arg	Gly	Gly	Asp	Gly	Lys	Met	Lys	Glu
65					70					75					80
Leu	Ser	Pro	Arg	Trp	Tyr	Phe	Tyr	Tyr	Leu	Gly	Thr	Gly	Pro	Glu	Ala
				85					90					95	
Ser	Leu	Pro	Tyr	Gly	Ala	Asn	Lys	Glu	Gly	Ile	Val	Trp	Val	Ala	Thr
			100					105					110		
Glu	Gly	Ala	Leu	Asn	Thr	Pro	Lys	Asp	His	Ile	Gly	Thr	Arg	Asn	Pro
		115					120					125			
Asn	Asn	Asn	Ala	Ala	Thr	Val	Leu	Gln	Leu	Pro	Gln	Gly	Thr	Thr	Leu
130						135					140				
Pro	Lys	Gly	Phe	Tyr	Ala	Glu	Gly	Ser	Arg	Gly	Gly	Ser	Gln	Ala	Ser
145					150					155					160
Ser	Arg	Ser	Ser	Ser	Arg	Ser	Arg	Gly	Asn	Ser	Arg	Asn	Ser	Thr	Pro
				165					170					175	
Gly	Ser	Ser	Arg	Gly	Asn	Ser	Pro	Ala	Arg	Met	Ala	Ser	Gly	Gly	Gly
			180					185					190		
Glu	Thr	Ala	Leu	Ala	Leu	Leu	Leu	Leu	Asp	Arg	Leu	Asn	Gln	Leu	Glu
		195					200					205			
Ser	Lys	Val	Ser	Gly	Lys	Gly	Gln	Gln	Gln	Gln	Gly	Gln	Thr	Val	Thr
	210					215					220				
Lys	Lys	Ser	Ala	Ala	Glu	Ala	Ser	Lys	Lys	Pro	Arg	Gln	Glu	Arg	Thr
225					230					235					240

Ala Thr Lys Gln Tyr Asn Val Thr Gln Ala Phe Gly Arg Arg Gly Pro
245 250 255

Glu Gln Thr Gln Gly Asn Phe Gly Asp Gln Asp Leu Ile Arg Gln Gly
260 265 270

Thr Asp Tyr Lys His Trp Pro Gln Ile Ala Gln Phe Ala Pro Ser Ala
275 280 285

Ser Ala Phe Phe Gly Met Ser Arg Ile Gly Met Glu Val Thr Pro Ser
290 295 300

Gly Thr Trp Leu Thr Tyr His Gly Ala Ile Lys Leu Asp Asp Lys Asp
305 310 315 320

Pro Gln Phe Lys Asp Asn Val Ile Leu Leu Asn Lys His Ile Asp Ala
325 330 335

Tyr Lys Thr Phe Pro Pro Thr Glu Pro Lys Lys Asp Lys Lys Lys Lys
340 345 350

Thr Asp Glu Ala Gln Pro Leu Pro Gln Arg Gln Lys Lys Gln Pro Thr
355 360 365

Val Thr Leu Leu Pro Ala Ala Asp Met Asp Asp Phe Ser Arg Gln Leu
370 375 380

Gln Asn Ser Met Ser Gly Ala Ser Ala Asp Ser Thr Gln Ala
385 390 395

<210> 14
<211> 91
<212> PRT
<213> SARS Coronaviruses (SARS-CoV)

<400> 14

Met Ala Ile Ser Pro Lys Phe Thr Thr Ser Leu Ser Leu His Lys Leu
1 5 10 15

Leu Gln Thr Leu Val Leu Lys Met Leu His Ser Ser Ser Leu Thr Ser
20 25 30

Leu Leu Lys Thr His Arg Met Cys Lys Tyr Thr Gln Ser Thr Ala Leu
35 40 45

Gln Glu Leu Gln Ile Gln Gln Trp Ile Gln Phe Met Met Ser Arg Arg
50 55 60

Arg Leu Leu Ala Cys Leu Cys Lys His Lys Lys Val Ser Thr Asn Leu
65 70 75 80

Cys Thr His Ser Phe Arg Lys Lys Gln Val Arg
85 90

<210> 15
<211> 29
<212> DNA
<213> Aritifical Sequence

<220>
<223> Synthetic primer

<400> 15
cctactgggtt accaacctga atggaatat 29

<210> 16
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic primer

<400> 16
acaggatcca agaacatggt tatttttctta tt 32

<210> 17
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthentic primer

<400> 17
agatctgaat tctatccaat aggaatgtcg cactc 35

<210> 18
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic primer

<400> 18
attggatcca ccatgggctg tcttatagga gctgagc 37

<210> 19
 <211> 35
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Synthetic primer

 <400> 19
 atggatccga attctggctg tgcagtaatt gatct 35

 <210> 20
 <211> 30
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Synthetic primer

 <400> 20
 caagatccg ttatgtactc attcgtttcg 30

 <210> 21
 <211> 35
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Synthetic primer

 <400> 21
 acaagatctg aattctttaa gtcctcaac ggtaa 35

 <210> 22
 <211> 29
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Synthetic primer

 <400> 22
 acagatcca tcatggcaga caacggtac 29

 <210> 23
 <211> 36
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Synthetic primer

 <400> 23
 aacagatctg aattcgcaat cctgaaagtc ctcata 36

<210> 24
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic primer

<400> 24
attggatccg tcatggacaa taaccagaat ggaggacg 38

<210> 25
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic primer

<400> 25
aacagatctg aattcattct gcacaagag 29

<210> 26
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic primer

<400> 26
acaccatgga attcgacatg gctatttcac cgaag 35

<210> 27
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic pimer

<400> 27
caggtaccgg atccaatatt gcagcagtac gcac 34

<210> 28
<211> 1255
<212> PRT
<213> SARS translated from nucleotides 21492-25259 of SEQ ID NO:1
coronaviruses (SARS-CoV)

<400> 28

Met Phe Ile Phe Leu Leu Phe Leu Thr Leu Thr Ser Gly Ser Asp Leu

1		5		10		15											
Asp	Arg	Cys	Thr	Thr	Phe	Asp	Asp	Val	Gln	Ala	Pro	Asn	Tyr	Thr	Gln		
			20					25					30				
His	Thr	Ser	Ser	Met	Arg	Gly	Val	Tyr	Tyr	Pro	Asp	Glu	Ile	Phe	Arg		
		35					40					45					
Ser	Asp	Thr	Leu	Tyr	Leu	Thr	Gln	Asp	Leu	Phe	Leu	Pro	Phe	Tyr	Ser		
	50					55					60						
Asn	Val	Thr	Gly	Phe	His	Thr	Ile	Asn	His	Thr	Phe	Asp	Asn	Pro	Val		
65					70					75					80		
Ile	Pro	Phe	Lys	Asp	Gly	Ile	Tyr	Phe	Ala	Ala	Thr	Glu	Lys	Ser	Asn		
				85					90					95			
Val	Val	Arg	Gly	Trp	Val	Phe	Gly	Ser	Thr	Met	Asn	Asn	Lys	Ser	Gln		
			100					105					110				
Ser	Val	Ile	Ile	Ile	Asn	Asn	Ser	Thr	Asn	Val	Val	Ile	Arg	Ala	Cys		
		115					120					125					
Asn	Phe	Glu	Leu	Cys	Asp	Asn	Pro	Phe	Phe	Ala	Val	Ser	Lys	Pro	Met		
	130					135					140						
Gly	Thr	Gln	Thr	His	Thr	Met	Ile	Phe	Asp	Asn	Ala	Phe	Asn	Cys	Thr		
145					150					155					160		
Phe	Glu	Tyr	Ile	Ser	Asp	Ala	Phe	Ser	Leu	Asp	Val	Ser	Glu	Lys	Ser		
				165					170					175			
Gly	Asn	Phe	Lys	His	Leu	Arg	Glu	Phe	Val	Phe	Lys	Asn	Lys	Asp	Gly		
			180					185					190				
Phe	Leu	Tyr	Val	Tyr	Lys	Gly	Tyr	Gln	Pro	Ile	Asp	Val	Val	Arg	Asp		
		195					200					205					
Leu	Pro	Ser	Gly	Phe	Asn	Thr	Leu	Lys	Pro	Ile	Phe	Lys	Leu	Pro	Leu		
	210					215					220						
Gly	Ile	Asn	Ile	Thr	Asn	Phe	Arg	Ala	Ile	Leu	Thr	Ala	Phe	Leu	Pro		
225					230					235					240		

Ala Gln Asp Thr Trp Gly Thr Ser Ala Ala Ala Tyr Phe Val Gly Tyr
 245 250 255

Leu Lys Pro Thr Thr Phe Met Leu Lys Tyr Asp Glu Asn Gly Thr Ile
 260 265 270

Thr Asp Ala Val Asp Cys Ser Gln Asn Pro Leu Ala Glu Leu Lys Cys
 275 280 285

Ser Val Lys Ser Phe Glu Ile Asp Lys Gly Ile Tyr Gln Thr Ser Asn
 290 295 300

Phe Arg Val Val Pro Ser Arg Asp Val Val Arg Phe Pro Asn Ile Thr
 305 310 315 320

Asn Leu Cys Pro Phe Gly Glu Val Phe Asn Ala Thr Lys Phe Pro Ser
 325 330 335

Val Tyr Ala Trp Glu Arg Lys Arg Ile Ser Asn Cys Val Ala Asp Tyr
 340 345 350

Ser Val Leu Tyr Asn Ser Thr Phe Phe Ser Thr Phe Lys Cys Tyr Gly
 355 360 365

Val Ser Ala Thr Lys Leu Asn Asp Leu Cys Phe Ser Asn Val Tyr Ala
 370 375 380

Asp Ser Phe Val Val Lys Gly Asp Asp Val Arg Gln Ile Ala Pro Gly
 385 390 395 400

Gln Thr Gly Val Ile Ala Asp Tyr Asn Tyr Lys Leu Pro Asp Asp Phe
 405 410 415

Met Gly Cys Val Leu Ala Trp Asn Thr Arg Asn Ile Asp Ala Thr Ser
 420 425 430

Thr Gly Asn Tyr Asn Tyr Lys Tyr Arg Tyr Leu Arg His Gly Lys Leu
 435 440 445

Arg Pro Phe Glu Arg Asp Ile Ser Asn Val Pro Phe Ser Pro Asp Gly
 450 455 460

Lys Pro Cys Thr Pro Pro Ala Leu Asn Cys Tyr Trp Pro Leu Asn Asp
 465 470 475 480

Tyr	Gly	Phe	Tyr	Thr	Thr	Thr	Gly	Ile	Gly	Tyr	Gln	Pro	Tyr	Arg	Val	
				485					490					495		
Val	Val	Leu	Ser	Phe	Glu	Leu	Leu	Asn	Ala	Pro	Ala	Thr	Val	Cys	Gly	
			500					505					510			
Pro	Lys	Leu	Ser	Thr	Asp	Leu	Ile	Lys	Asn	Gln	Cys	Val	Asn	Phe	Asn	
		515					520					525				
Phe	Asn	Gly	Leu	Thr	Gly	Thr	Gly	Val	Leu	Thr	Pro	Ser	Ser	Lys	Arg	
	530					535					540					
Phe	Gln	Pro	Phe	Gln	Gln	Phe	Gly	Arg	Asp	Val	Ser	Asp	Phe	Thr	Asp	
545					550					555					560	
Ser	Val	Arg	Asp	Pro	Lys	Thr	Ser	Glu	Ile	Leu	Asp	Ile	Ser	Pro	Cys	
				565					570							
Ser	Phe	Gly	Gly	Val	Ser	Val	Ile	Thr	Pro	Gly	Thr	Asn	Ala	Ser	Ser	
			580					585					590			
Glu	Val	Ala	Val	Leu	Tyr	Gln	Asp	Val	Asn	Cys	Thr	Asp	Val	Ser	Thr	
		595					600					605				
Ala	Ile	His	Ala	Asp	Gln	Leu	Thr	Pro	Ala	Trp	Arg	Ile	Tyr	Ser	Thr	
	610					615					620					
Gly	Asn	Asn	Val	Phe	Gln	Thr	Gln	Ala	Gly	Cys	Leu	Ile	Gly	Ala	Glu	
625					630					635					640	
His	Val	Asp	Thr	Ser	Tyr	Glu	Cys	Asp	Ile	Pro	Ile	Gly	Ala	Gly	Ile	
				645					650					655		
Cys	Ala	Ser	Tyr	His	Thr	Val	Ser	Leu	Leu	Arg	Ser	Thr	Ser	Gln	Lys	
			660					665					670			
Ser	Ile	Val	Ala	Tyr	Thr	Met	Ser	Leu	Gly	Ala	Asp	Ser	Ser	Ile	Ala	
		675					680					685				
Tyr	Ser	Asn	Asn	Thr	Ile	Ala	Ile	Pro	Thr	Asn	Phe	Ser	Ile	Ser	Ile	
	690					695					700					
Thr	Thr	Glu	Val	Met	Pro	Val	Ser	Met	Ala	Lys	Thr	Ser	Val	Asp	Cys	
705					710					715					720	

Asn Met Tyr Ile Cys Gly Asp Ser Thr Glu Cys Ala Asn Leu Leu Leu
725 730 735

Gln Tyr Gly Ser Phe Cys Thr Gln Leu Asn Arg Ala Leu Ser Gly Ile
740 745 750

Ala Ala Glu Gln Asp Arg Asn Thr Arg Glu Val Phe Ala Gln Val Lys
755 760 765

Gln Met Tyr Lys Thr Pro Thr Leu Lys Asp Phe Gly Gly Phe Asn Phe
770 775 780

Ser Gln Ile Leu Pro Asp Pro Leu Lys Pro Thr Lys Arg Ser Phe Ile
785 790 795 800

Glu Asp Leu Leu Phe Asn Lys Val Thr Leu Ala Asp Ala Gly Phe Met
805 810 815

Lys Gln Tyr Gly Glu Cys Leu Gly Asp Ile Asn Ala Arg Asp Leu Ile
820 825 830

Cys Ala Gln Lys Phe Asn Gly Leu Thr Val Leu Pro Pro Leu Leu Thr
835 840 845

Asp Asp Met Ile Ala Ala Tyr Thr Ala Ala Leu Val Ser Gly Thr Ala
850 855 860

Thr Ala Gly Trp Thr Phe Gly Ala Gly Ala Ala Leu Gln Ile Pro Phe
865 870 875 880

Ala Met Gln Met Ala Tyr Arg Phe Asn Gly Ile Gly Val Thr Gln Asn
885 890 895

Val Leu Tyr Glu Asn Gln Lys Gln Ile Ala Asn Gln Phe Asn Lys Ala
900 905 910

Ile Ser Gln Ile Gln Glu Ser Leu Thr Thr Thr Ser Thr Ala Leu Gly
915 920 925

Lys Leu Gln Asp Val Val Asn Gln Asn Ala Gln Ala Leu Asn Thr Leu
930 935 940

Val Lys Gln Leu Ser Ser Asn Phe Gly Ala Ile Ser Ser Val Leu Asn

945		950		955		960									
Asp	Ile	Leu	Ser	Arg	Leu	Asp	Lys	Val	Glu	Ala	Glu	Val	Gln	Ile	Asp
				965					970					975	
Arg	Leu	Ile	Thr	Gly	Arg	Leu	Gln	Ser	Leu	Gln	Thr	Tyr	Val	Thr	Gln
			980					985					990		
Gln	Leu	Ile	Arg	Ala	Ala	Glu	Ile	Arg	Ala	Ser	Ala	Asn	Leu	Ala	Ala
		995					1000					1005			
Thr	Lys	Met	Ser	Glu	Cys	Val	Leu	Gly	Gln	Ser	Lys	Arg	Val	Asp	
	1010						1015				1020				
Phe	Cys	Gly	Lys	Gly	Tyr	His	Leu	Met	Ser	Phe	Pro	Gln	Ala	Ala	
	1025					1030					1035				
Pro	His	Gly	Val	Val	Phe	Leu	His	Val	Thr	Tyr	Val	Pro	Ser	Gln	
	1040					1045					1050				
Glu	Arg	Asn	Phe	Thr	Thr	Ala	Pro	Ala	Ile	Cys	His	Glu	Gly	Lys	
	1055					1060					1065				
Ala	Tyr	Phe	Pro	Arg	Glu	Gly	Val	Phe	Val	Phe	Asn	Gly	Thr	Ser	
	1070					1075					1080				
Trp	Phe	Ile	Thr	Gln	Arg	Asn	Phe	Phe	Ser	Pro	Gln	Ile	Ile	Thr	
	1085					1090					1095				
Thr	Asp	Asn	Thr	Phe	Val	Ser	Gly	Asn	Cys	Asp	Val	Val	Ile	Gly	
	1100					1105					1110				
Ile	Ile	Asn	Asn	Thr	Val	Tyr	Asp	Pro	Leu	Gln	Pro	Glu	Leu	Asp	
	1115					1120					1125				
Ser	Phe	Lys	Glu	Glu	Leu	Asp	Lys	Tyr	Phe	Lys	Asn	His	Thr	Ser	
	1130					1135					1140				
Pro	Asp	Val	Asp	Leu	Gly	Asp	Ile	Ser	Gly	Ile	Asn	Ala	Ser	Val	
	1145					1150					1155				
Val	Asn	Ile	Gln	Glu	Glu	Ile	Asp	Arg	Leu	Asn	Glu	Val	Ala	Lys	
	1160					1165					1170				

Asn Leu Asn Glu Ser Leu Ile Asp Leu Gln Glu Leu Gly Lys Tyr
1175 1180 1185

Glu Gln Tyr Ile Lys Trp Pro Trp Tyr Val Trp Leu Gly Phe Ile
1190 1195 1200

Ala Gly Leu Ile Ala Ile Val Met Val Thr Ile Leu Leu Cys Cys
1205 1210 1215

Met Thr Ser Cys Cys Ser Cys Leu Lys Gly Ala Cys Ser Cys Gly
1220 1225 1230

Ser Cys Cys Lys Phe Asp Glu Asp Asp Ser Glu Pro Val Leu Lys
1235 1240 1245

Gly Val Lys Leu His Tyr Thr
1250 1255

<210> 29
<211> 274
<212> PRT
<213> SARS translated from nucleotides 25268-26092 of SEQ ID NO:1
coronaviruses (SARS-CoV)

<400> 29

Met Asp Leu Phe Met Arg Phe Phe Thr Leu Gly Ser Ile Thr Ala Gln
1 5 10 15

Pro Val Lys Ile Asp Asn Ala Ser Pro Ala Ser Thr Val His Ala Thr
20 25 30

Ala Thr Ile Pro Leu Gln Ala Ser Leu Pro Phe Gly Trp Leu Val Ile
35 40 45

Gly Val Ala Phe Leu Ala Val Phe Gln Ser Ala Thr Lys Ile Ile Ala
50 55 60

Leu Asn Lys Arg Trp Gln Leu Ala Leu Tyr Lys Gly Phe Gln Phe Ile
65 70 75 80

Cys Asn Leu Leu Leu Leu Phe Val Thr Ile Tyr Ser His Leu Leu Leu
85 90 95

Val Ala Ala Gly Met Glu Ala Gln Phe Leu Tyr Leu Tyr Ala Leu Ile
100 105 110

Tyr Phe Leu Gln Cys Ile Asn Ala Cys Arg Ile Ile Met Arg Cys Trp
115 120 125

Leu Cys Trp Lys Cys Lys Ser Lys Asn Pro Leu Leu Tyr Asp Ala Asn
130 135 140

Tyr Phe Val Cys Trp His Thr His Asn Tyr Asp Tyr Cys Ile Pro Tyr
145 150 155 160

Asn Ser Val Thr Asp Thr Ile Val Val Thr Ala Gly Asp Gly Ile Ser
165 170 175

Thr Pro Lys Leu Lys Glu Asp Tyr Gln Ile Gly Gly Tyr Ser Glu Asp
180 185 190

Trp His Ser Gly Val Lys Asp Tyr Val Val Val His Gly Tyr Phe Thr
195 200 205

Glu Val Tyr Tyr Gln Leu Glu Ser Thr Gln Ile Thr Thr Asp Thr Gly
210 215 220

Ile Glu Asn Ala Thr Phe Phe Ile Phe Asn Lys Leu Val Lys Asp Pro
225 230 235 240

Pro Asn Val Gln Ile His Thr Ile Asp Gly Ser Ser Gly Val Ala Asn
245 250 255

Pro Ala Met Asp Pro Ile Tyr Asp Glu Pro Thr Thr Thr Thr Ser Val
260 265 270

Pro Leu

<210> 30
<211> 154
<212> PRT
<213> SARS translated from nucleotides 25689-26153 of SEQ ID NO:1
coronaviruses (SARS-CoV))

<400> 30

Met Met Pro Thr Thr Leu Phe Ala Gly Thr His Ile Thr Met Thr Thr
1 5 10 15

Val Tyr His Ile Thr Val Ser Gln Ile Gln Leu Ser Leu Leu Gln Val
20 25 30

Thr Ala Phe Gln His Gln Asn Ser Lys Lys Thr Thr Lys Leu Val Val
35 40 45

Ile Leu Arg Ile Gly Thr Gln Val Leu Lys Thr Met Ser Leu Tyr Met
50 55 60

Ala Ile Ser Pro Lys Phe Thr Thr Ser Leu Ser Leu His Lys Leu Leu
65 70 75 80

Gln Thr Leu Val Leu Lys Met Leu His Ser Ser Ser Leu Thr Ser Leu
85 90 95

Leu Lys Thr His Arg Met Cys Lys Tyr Thr Gln Ser Thr Ala Leu Gln
100 105 110

Glu Leu Gln Ile Gln Gln Trp Ile Gln Phe Met Met Ser Arg Arg Arg
115 120 125

Leu Leu Ala Cys Leu Cys Lys His Lys Lys Val Ser Thr Asn Leu Cys
130 135 140

Thr His Ser Phe Arg Lys Lys Gln Val Arg
145 150

<210> 31
<211> 76
<212> PRT
<213> SARS translated from nucleotides 26117-26347 of SEQ ID NO:1
coronaviruses (SARS-CoV)

<400> 31

Met Tyr Ser Phe Val Ser Glu Glu Thr Gly Thr Leu Ile Val Asn Ser
1 5 10 15

Val Leu Leu Phe Leu Ala Phe Val Val Phe Leu Leu Val Thr Leu Ala
20 25 30

Ile Leu Thr Ala Leu Arg Leu Cys Ala Tyr Cys Cys Asn Ile Val Asn
35 40 45

Val Ser Leu Val Lys Pro Thr Val Tyr Val Tyr Ser Arg Val Lys Asn
50 55 60

Leu Asn Ser Ser Glu Gly Val Pro Asp Leu Leu Val

65

70

75

<210> 32

<211> 218

<212> PRT

<213> SARS translated from nucleotides 26398-27063 of SEQ ID NO:1
coronaviruses (SARS-CoV)

<400> 32

Met Ala Asp Asn Gly Thr Ile Thr Val Glu Glu Leu Lys Gln Leu Leu
1 5 10 15Glu Gln Trp Asn Leu Val Ile Gly Phe Leu Phe Leu Ala Trp Ile Met
20 25 30Leu Leu Gln Phe Ala Tyr Ser Asn Arg Asn Arg Phe Leu Tyr Ile Ile
35 40 45Lys Leu Val Phe Leu Trp Leu Leu Trp Pro Val Thr Leu Ala Cys Phe
50 55 60Val Leu Ala Ala Val Tyr Arg Ile Asn Trp Val Thr Gly Gly Ile Ala
65 70 75 80Ile Ala Met Ala Cys Ile Val Gly Leu Met Trp Leu Ser Tyr Phe Val
85 90 95Ala Ser Phe Arg Leu Phe Ala Arg Thr Arg Ser Met Trp Ser Phe Asn
100 105 110Pro Glu Thr Asn Ile Leu Leu Asn Val Pro Leu Arg Gly Thr Ile Val
115 120 125Thr Arg Pro Leu Met Glu Ser Glu Leu Val Ile Gly Ala Val Ile Ile
130 135 140Arg Gly His Leu Arg Met Ala Gly His Ser Leu Gly Arg Cys Asp Ile
145 150 155 160Lys Asp Leu Pro Lys Glu Ile Thr Val Ala Thr Ser Arg Thr Leu Ser
165 170 175Tyr Tyr Lys Leu Gly Ala Ser Gln Arg Val Gly Thr Asp Ser Gly Phe
180 185 190

Ala Ala Tyr Asn Arg Tyr Arg Ile Gly Asn Tyr Lys Leu Asn Thr Asp
195 200 205

His Ala Gly Ser Asn Asp Asn Ile Ala Leu
210 215

<210> 33
<211> 63
<212> PRT
<213> SARS translated from nucleotides 27074-27265 of SEQ ID NO:1
coronaviruses (SARS-CoV)

<400> 33

Met Phe His Leu Val Asp Phe Gln Val Thr Ile Ala Glu Ile Leu Ile
1 5 10 15

Ile Ile Met Arg Thr Phe Arg Ile Ala Ile Trp Asn Leu Asp Val Ile
20 25 30

Ile Ser Ser Ile Val Arg Gln Leu Phe Lys Pro Leu Thr Lys Lys Asn
35 40 45

Tyr Ser Glu Leu Asp Asp Glu Glu Pro Met Glu Leu Asp Tyr Pro
50 55 60

<210> 34
<211> 44
<212> PRT
<213> SARS translated from nucleotides 27638-27772 of SEQ ID NO:1
coronaviruses (SARS-CoV)

<400> 34

Met Asn Glu Leu Thr Leu Ile Asp Phe Tyr Leu Cys Phe Leu Ala Phe
1 5 10 15

Leu Leu Phe Leu Val Leu Ile Met Leu Ile Ile Phe Trp Phe Ser Leu
20 25 30

Glu Ile Gln Asp Leu Glu Glu Pro Cys Thr Lys Val
35 40

<210> 35
<211> 122
<212> PRT
<213> SARS translated from nucleotides 27779-28147 of SEQ ID NO:1
coronaviruses (SARS-CoV)

<400> 35

Met Lys Leu Leu Ile Val Leu Thr Cys Ile Ser Leu Cys Ser Cys Ile
1 5 10 15

Arg Thr Val Val Gln Arg Cys Ala Ser Asn Lys Pro His Val Leu Glu
20 25 30

Asp Pro Cys Pro Thr Gly Tyr Gln Pro Glu Trp Asn Ile Arg Tyr Asn
35 40 45

Thr Arg Gly Asn Thr Tyr Ser Thr Ala Trp Leu Cys Ala Leu Gly Lys
50 55 60

Val Leu Pro Phe His Arg Trp His Thr Met Val Gln Thr Cys Thr Pro
65 70 75 80

Asn Val Thr Ile Asn Cys Gln Asp Pro Ala Gly Gly Ala Leu Ile Ala
85 90 95

Arg Cys Trp Tyr Leu His Glu Gly His Gln Thr Ala Ala Phe Arg Asp
100 105 110

Val Phe Val Val Leu Asn Lys Arg Thr Asn
115 120

<210> 36
<211> 422
<212> PRT
<213> SARS translated from nucleotides 28149-29417 of SEQ ID NO:1
coronaviruses (SARS-CoV)

<400> 36

Met Ser Asp Asn Gly Pro Gln Ser Asn Gln Arg Ser Ala Pro Arg Ile
1 5 10 15

Thr Phe Gly Gly Pro Thr Asp Ser Thr Asp Asn Asn Gln Asn Gly Gly
20 25 30

Arg Asn Gly Ala Arg Pro Lys Gln Arg Arg Pro Gln Gly Leu Pro Asn
35 40 45

Asn Thr Ala Ser Trp Phe Thr Ala Leu Thr Gln His Gly Lys Glu Glu
50 55 60

Leu Arg Phe Pro Arg Gly Gln Gly Val Pro Ile Asn Thr Asn Ser Gly
65 70 75 80

Pro Asp Asp Gln Ile Gly Tyr Tyr Arg Arg Ala Thr Arg Arg Val Arg
85 90 95

Gly Gly Asp Gly Lys Met Lys Glu Leu Ser Pro Arg Trp Tyr Phe Tyr
100 105 110

Tyr Leu Gly Thr Gly Pro Glu Ala Ser Leu Pro Tyr Gly Ala Asn Lys
115 120 125

Glu Gly Ile Val Trp Val Ala Thr Glu Gly Ala Leu Asn Thr Pro Lys
130 135 140

Asp His Ile Gly Thr Arg Asn Pro Asn Asn Asn Ala Ala Thr Val Leu
145 150 155 160

Gln Leu Pro Gln Gly Thr Thr Leu Pro Lys Gly Phe Tyr Ala Glu Gly
165 170 175

Ser Arg Gly Gly Ser Gln Ala Ser Ser Arg Ser Ser Ser Arg Ser Arg
180 185 190

Gly Asn Ser Arg Asn Ser Thr Pro Gly Ser Ser Arg Gly Asn Ser Pro
195 200 205

Ala Arg Met Ala Ser Gly Gly Gly Glu Thr Ala Leu Ala Leu Leu Leu
210 215 220

Leu Asp Arg Leu Asn Gln Leu Glu Ser Lys Val Ser Gly Lys Gly Gln
225 230 235 240

Gln Gln Gln Gly Gln Thr Val Thr Lys Lys Ser Ala Ala Glu Ala Ser
245 250 255

Lys Lys Pro Arg Gln Lys Arg Thr Ala Thr Lys Gln Tyr Asn Val Thr
260 265 270

Gln Ala Phe Gly Arg Arg Gly Pro Glu Gln Thr Gln Gly Asn Phe Gly
275 280 285

Asp Gln Asp Leu Ile Arg Gln Gly Thr Asp Tyr Lys His Trp Pro Gln
290 295 300

Ile Ala Gln Phe Ala Pro Ser Ala Ser Ala Phe Phe Gly Met Ser Arg

305 310 315 320

Ile Gly Met Glu Val Thr Pro Ser Gly Thr Trp Leu Thr Tyr His Gly
325 330 335

Ala Ile Lys Leu Asp Asp Lys Asp Pro Gln Phe Lys Asp Asn Val Ile
340 345 350

Leu Leu Asn Lys His Ile Asp Ala Tyr Lys Thr Phe Pro Pro Thr Glu
355 360 365

Pro Lys Lys Asp Lys Lys Lys Lys Thr Asp Glu Ala Gln Pro Leu Pro
370 375 380

Gln Arg Gln Lys Lys Gln Pro Thr Val Thr Leu Leu Pro Ala Ala Asp
385 390 395 400

Met Asp Asp Phe Ser Arg Gln Leu Gln Asn Ser Met Ser Gly Ala Ser
405 410 415

Ala Asp Ser Thr Gln Ala
420

<210> 37
<211> 98
<212> PRT
<213> SARS translated from nucleotides 28159-28455 of SEQ ID NO:1
coronaviruses (SARS-CoV)

<400> 37

Met Asp Pro Asn Gln Thr Asn Val Val Pro Pro Ala Leu His Leu Val
1 5 10 15

Asp Pro Gln Ile Gln Leu Thr Ile Thr Arg Met Glu Asp Ala Met Gly
20 25 30

Gln Gly Gln Asn Ser Ala Asp Pro Lys Val Tyr Pro Ile Ile Leu Arg
35 40 45

Leu Gly Ser Gln Leu Ser Leu Ser Met Ala Arg Arg Asn Leu Asp Ser
50 55 60

Leu Glu Ala Arg Ala Phe Gln Ser Thr Pro Ile Val Val Gln Met Thr
65 70 75 80

Lys Leu Ala Thr Thr Glu Glu Leu Pro Asp Glu Phe Val Val Val Thr
85 90 95

Ala Lys